

## **I. Amendments to the Claims:**

This listing of claims replaces without prejudice all prior versions and listings of claims in the application:

### **Listing of Claims:**

1. (Currently Amended) A thick-film electric heater, comprising:

- a) a thermally conductive non-flat substrate surface;
- b) a silk-screened dielectric layer applied on said substrate surface;
- c) a resistive layer applied on said dielectric layer thereby forming a circuit for the generation of heat, the resistive layer having at least one resistive trace made of thick film ink in a pattern that is discontinuous circumferentially;
- d) at least a pair of silk-screened contact pads applied in electrical communication with said resistive layer for electrical connection to a power source; ~~and~~
- e) an insulation layer applied over said resistive layer; and
- f) wherein the thermally conductive non-flat substrate surface has a thermal coefficient of expansion substantially the same or slightly lower than the dielectric and resistive layers.

2. (Previously Presented) The heater of claim 1, further comprising a connector housing for connection of a contact to each of said contact pads.

3. (Previously Presented) The heater of claim 1, where said non-flat surface is cylindrical.

4. (Original) The heater of claim 1, where said substrate further comprises a longitudinal slot running the entire length of said substrate.

5. (Previously Presented) The heater of claim 1, where said resistive layer further comprises at least one low-resistance conductive trace in electrical communication with the at least one resistive trace, thereby forming an optimized heating generating pattern.

6. (Cancelled).

7. (Original) The heater of claim 5, where said conductive trace is silk-screened on said dielectric layer.

8. (Original) The heater of claim 1, where said resistive layer is silk-screened on to said dielectric layer.

9. (Original) The heater of claim 1, where said resistive layer is directly printed on to said dielectric layer.

10. (Previously Presented) The heater of claim 2, where said connector housing further comprises a locking detent that engages a locating hole on said substrate.

11. (Original) The heater of claim 10, where said locking detent is selectably removable from said locating hole.

12. (Original) The heater of claim 10, where said detent and said locating hole are in a predetermined arrangement relative to said contacts, thereby ensuring electrical communication of said contacts to said contact pads when said detent engages said hole.

13. (Previously Presented) The heater of claim 2, where said connector housing further comprises a key for slidably engaging a longitudinal slot in said substrate, thereby aligning radially said contacts with said contact pads.

14. (Previously Presented) The heater of claim 2, where said connector housing is made from a ceramic material.

15. (Original) The heater of claim 1, where said substrate is a nozzle body.

16. (Original) The heater of claim 1, where said substrate is made from steel.

17. (Original) The heater of claim 1, where said dielectric layer has a dielectric strength between 1000 VAC to 1500 VAC and an insulation resistance of at least 100 mega-ohms.

18. (Original) The heater of claim 1, where said substrate and said dielectric layer and said resistive layer and said insulation layer have substantially the same coefficient of thermal expansion.

19. (Original) The heater of claim 18, where said substrate has a slightly lower coefficient of thermal expansion than said dielectric, resistive and insulation layer.

20. (Original) The heater of claim 1, where said resistive layer is applied to said dielectric layer by photoforming.

21. (Original) The heater of claim 1, where said resistive layer is formed by laser or abrasive etching.

22. (Previously Presented) The heater of claim 2, where said contact is made from gold plated steel.

23-27. (Cancelled).

28. (Currently Amended) An injection mold runner nozzle having a coaxially disposed cylindrical heater comprising:

- a) a cylindrical, thermally conductive substrate having a smaller coefficient of thermal expansion than that of said nozzle, thereby causing said substrate to clamp onto said nozzle as said nozzle and said substrate heat up;

- b) a dielectric layer applied on said substrate;
- c) a resistive layer applied on said dielectric layer thereby forming an electrical circuit for heat generation, the resistive layer having at least one resistive trace made of thick film ink in a pattern that is discontinuous circumferentially around the substrate;
- d) at least a pair of contact pads applied in electrical communication with said resistive layer for electrical connection to a power source; ~~and~~
- e) an insulation layer applied over said resistive layer; and
- f) wherein the cylindrical, thermally conductive substrate has a thermal coefficient of expansion substantially the same or slightly lower than the dielectric and resistive layers.

29. (Previously Presented) The nozzle of claim 28, wherein the heater further comprises an annular connector housing that slidably engages said substrate for mechanical connection of a contact to each said contact pads.

30. (Currently Amended) A thick-film electric heater, comprising:
- a) a thermally conductive non-flat substrate surface;
  - b) a dielectric layer applied on said substrate surface;
  - c) a resistive layer applied on said dielectric layer thereby forming a circuit for the generation of heat, the resistive layer having at least one resistive trace made of thick film ink in a pattern that is discontinuous circumferentially;

- d) at least a pair of contact pads applied in electrical communication with said resistive layer for electrical connection to a power source; ~~and~~
- e) an insulation layer applied over said resistive layer; and
- f) wherein the thermally conductive non-flat substrate surface has a thermal coefficient of expansion substantially the same or slightly lower than the dielectric and resistive layers.

31. (Previously Presented) The heater of claim 30, where said at least one resistive trace is a plurality of traces configured to optimize an axial thermal profile of the heater.